
The problem with weighing:

effects on mood, self esteem and body image

Jane Ogden and Ceri Evans

Department of General Practice, UMDS, London University, London.

Address correspondence to:
Dr Jane Ogden,
Department of General Practice,
UMDS,
80 Kennington Road,
London, SE11 6SP
Abstract

Objective: To examine the effect of weighing and comparison with social norms on self esteem, mood and body dissatisfaction.

Design: An experimental design was used.

Subjects: Seventy four normal weight individuals took part in the study.

Procedure: Subjects completed a set of measures before and after being weighed and sequentially allocated to either the under, average or over weight conditions according to a fictional height / weight chart.

Results: The results showed that subjects allocated to the overweight group showed an increase in depression and a decrease in self esteem following the manipulation, compared to subjects in the average weight group who reported improvements in these measures and the underweight group who similarly showed decreased depression, but showed some deterioration in their self esteem.

Conclusion: Weighing and comparison with height weight charts of weight norms is used both to detect and treat overweight and obesity. The results from this study indicate that this procedure may not be as benign as believed and may contribute to the negative psychological state of the individual.

Keywords: weighing social norms obesity treatment mood self esteem
**Introduction**

Body dissatisfaction is often expressed in discrepancies between perceived and desired body size and restriction of food intake (1-3). Research indicates that body dissatisfaction also has a moderating effect on self-esteem. Rosen and Ross (4) concluded that satisfaction with body image and satisfaction with self-concept are positively related and Silberstein et al (5) stated that “at the core of the phenomenology of body image dissatisfaction are.....the perceived self and the ideal self”, and suggested that a failure to match the internalised ideal is likely to prompt self-criticism and damage self-esteem. Body dissatisfaction has also been linked to changes in mood. For example, Taylor and Cooper (6) found a significant association between depressed mood and overestimations of body size in 50 females with no history of eating disorder. In addition, Cohen-Tovee (7) induced a depressive state in 33 female subjects and found that concerns regarding weight and shape increased in those subjects placing a high personal value on these variables. Thus, mood may have an accentuating effect on concerns regarding weight and shape. However, a study by Kaplan et al (8) suggests that the corollary may be true and that concerns regarding weight may have an effect on mood. In a study of 11-18 year olds it was found that subjects who perceived themselves to be of normal weight reported lower levels of depressed mood than those who thought they were underweight or overweight.

The current pervasive incidence of body dissatisfaction and dieting has been called 'normative discontent' (9) and has been linked to social norms of appearance and thinness (10, 11). The role of social norms is highlighted in Slade's (12) multifactorial model of body image, which describes body image as a ‘loose mental representation of the body’ based on norms and additional factors
such as sensory input to body experience, history of weight change/fluctuation, individual attitudes to weight and shape. Social norms of thinness may act by increasing the discrepancy between perceived and ideal body size, thereby contributing towards body dissatisfaction and resulting behaviours such as dieting aimed to reduce the gap.

The media have been identified as an important source of social norms of thinness. It is suggested that comparisons between the self and media ideals creates dissatisfaction and 'shame' (13-15) and that media stereotypes create and perpetuate the association between ideals of thinness and positive attributes such as a sense of control, success and attractiveness (10, 11, 16). In addition, the media is deemed responsible for the association between fatness and negative attributes of self indulgence, lethargy and slovenliness (11, 16). The increased prevalence of dieting behaviour has been related to the decreased size of fashion models (15) and changes in the stereotypically attractive women in the late 20th century has been cited as possible reasons for the increase in eating disorders (10, 15).

However, the media is not the only source of social norms - the health profession also has an important role to play. Health research has identified obesity as an independent risk factor for cardiovascular disease, and has reported associations with hypertension, hypercholesterolaemia and type II diabetes (17). In addition, it is often assumed that the obese are stigmatised and suffer subsequent psychological problems such as depression and lowered self esteem (18, 19). As a result, health professionals encourage the avoidance and treatment of obesity. However, defining overweight and obesity is problematic, with definitions based on hips to waist ratios,
body mass index, percentage body fat and the simple use of weight compared to tables developed by insurance companies. Furthermore, all such methodologies involve a comparison between the individual and social norms. For example, if defined using height/weight tables, the convention has been to recommend the weight which appears to be associated with the lowest incidence of obesity-related diseases; a population statistic based on norms. In addition, these techniques are not only used to define obesity, but are often central to treatment interventions which use changes in weight as either a positive or negative reinforcer for the individual's behaviour. This practice assumes that weighing an individual in order both to define their weight problem and to facilitate weight loss is a benign procedure which may have only beneficial consequences. However, it is possible that using weighing in treatment may exacerbate or create any problems with body dissatisfaction, self esteem and mood by encouraging the individual to make comparisons between their own weight / shape and that presented as the acceptable norm.

The aim of the present study was to investigate experimentally the effect of weighing normal weight men and women and comparing their weight to manipulated social norms of healthy weight on their body dissatisfaction, self esteem and mood. The study also examined the effect of gender and dieting on the subject's response to the manipulation.

**Methodology**

**Subjects**
Seventy four subjects took part in the study (35 women and 39 men). 57 were recruited from a further education college and were studying for vocational courses such as city and guilds, NVQ
and secretarial qualifications and 17 were medical students from a London medical school. This sample was selected to provide a variety of individuals from different backgrounds. The subjects’ ages ranged from 17 to 49.

Design
The study was experimental consisting of both a between and within subject design with three conditions. The between subject variables were gender (male vs female), dieting (dieters vs non-dieters) and condition (being told that according to a fictional height/weight chart they were either underweight, average or overweight). The within subject variable was time (time 1 (before manipulation), time 2 (after manipulation)). All subjects completed a set of measures before (time 1) and after (time 2) being weighed by the experimenter and sequentially (i.e. regardless of actual weight) allocated to one of the three conditions.

Procedure
Data was collected on several separate sessions, involving groups of 3-12 subjects. The further education college and the lecturers at the medical school were asked if the students could take part in a study examining body image in men and women. The subjects were told that the study aimed to examine how men and women felt about the way they looked and how this related to their self esteem. The subjects completed the questionnaire up to where it was indicated that the subjects would be weighed (time 1 measures). At this point, the subjects approached the researcher and were weighed on a set of bathroom-type scales (the manipulation). Having recorded their weight and asked for their height, the researcher then consulted a fictional height/weight chart and
allocated the subject to one of the conditions. For subjects who appeared to be of normal weight the researcher stated: ‘according to this chart you are underweight / average / overweight for your height’. The allocation was achieved by allocating the first subject to condition 1 (underweight), the second to condition 2 (average weight), the third to condition 3 (overweight) and so on. This procedure was carried out for 74 subjects. Subjects who were deemed to be either underweight or overweight by the researcher, and who would therefore not be convinced by the manipulation, were told that they were either underweight or overweight accordingly (the data from these subjects (n=6) was discarded from the analysis). Having been informed of their weight rating the subjects then completed the rest of the questionnaire (time 2 measures). In order to minimise the problem of sharing information, subjects were asked to complete the questionnaire quietly and not to discuss it with others. Once all the members of the group had completed the questionnaires, the subjects were fully debriefed and offered correct height/weight charts should they wish to check their true weight category.

**Measurements**

The questionnaire consisted of the following measurements in the order given:

**Time 1 measures:**

i) Mood

Subjects were asked to rate how depressed and anxious they were feeling, at that precise moment in time, using visual analogue scales ranging from “not at all” (0mm) to “very much” (100mm).

ii) Self-esteem
This was measured in two ways:

Subjects were asked to rate the following questions using visual analogue scales ranging from “not at all” (0mm) to “very much” (100mm): do you feel confident?, do you feel reliable?, do you feel displeased with yourself?, do you feel easily hurt?, do you feel intelligent?, do you feel inadequate?, do you feel likeable?, do you feel attractive as a person? These items were summated to produce a total self esteem score.

Subjects also completed the Rosenberg Self-esteem Scale (20) and were asked rate a list of ten statements relating to self-esteem. The responses were coded from strongly disagree (1) to strongly agree (4).

A high score for both measures indicated high self-esteem.

iii) Body dissatisfaction

This was measured in two ways:

Subjects were asked to rate the following questions using visual analogue scales ranging from “not at all” (0mm) to “very much” (100mm): do you feel physically attractive?, do you feel happy with your weight?, do you feel physically fit?, do you feel preoccupied with your weight?, do you feel dissatisfied with your body shape? These items were summated to produce a total body dissatisfaction score. A higher score indicated greater satisfaction.

Subjects were also given a set of body silhouettes to rate ranging from extremely thin (1) to
extremely obese (12) which were matched for the subjects’ gender. The silhouettes were arranged randomly so as to encourage consideration. The subjects were asked to rate them for: 'how they felt they looked at that precise moment in time', 'how they would like to look like', and 'what they thought was the norm'. These gave scores for perceived body size, discrepancy between perceived and ideal, discrepancy between perceived and social norm.

**Experimental Manipulation**

At this point the subjects were weighed and told that they were underweight, average or overweight according to a fictional height / weight chart.

**Time 2 measures**

After the manipulation, subjects completed another set of mood, self esteem and body dissatisfaction measures.

**Profile factors**

Subjects also completed a set of profile measures:

i) Dieting: Subjects were asked to complete the restrained eating section of the Dutch Eating Behaviour Questionnaire (DEBQ, 21, 22). This was included to examine whether dieters and non dieters responded differently to the manipulation.

ii) Subjects also recorded their age, sex, occupation, height and weight.

**Results**
The results were analysed to examine profile differences between subjects in the three conditions using ANOVA (SPSSPC). The results were then analysed to assess the effect of the experimental manipulation on mood, self-esteem and body dissatisfaction and to evaluate the role of gender and dieting using repeated measures ANOVA (SPSSPC).

**Subject Characteristics**

The profile characteristics for all subjects are shown in table 1.

- Insert Table 1 about here -

The results showed that the subjects in the three conditions were matched in terms of age, sex and height. However, the subjects designated to the overweight condition were significantly heavier ($F[2,75]=6.74, p<0.005$) had a significantly higher BMI ($F[2,75]=15.12, p<0.001$) and a significantly higher score on the measure of restrained eating ($F[2,75]=3.55, p<0.05$) than the subjects allocated to either the average weight or underweight conditions. This effect may be due to chance as a sequential allocation cannot guarantee equal distribution between groups, particularly when subject numbers are quite low. However, this may also reflect that the allocation of subjects to the three conditions was not completely random: even though all subjects included in this analysis were deemed to be average weight by the researcher, those who were heavier may have been more likely to be allocated to the overweight condition, and those who were lighter may have been more likely to be allocated to the underweight condition.
Effect of the Experimental Manipulation

The results were then analysed to assess the effect of the experimental manipulation on subjects’ ratings of mood, self-esteem, body dissatisfaction using repeated measures ANOVA (SPSSPC). Because of the baseline differences in body weight and BMI between the three groups, BMI was included as a covariate throughout the analysis of all of the variables (repeated measures ANCOVA, SPSSPC). The means for the ratings of mood, self esteem and body dissatisfaction are shown in table 2.

- Insert Table 2 about here -

i) Mood

The ratings of depression showed no significant main effects for either time or condition, but showed a significant condition by interaction (F[2,75]=3.62, p<0.05). Examination of the means indicates that whereas subjects in both the underweight and average weight conditions became less depressed over time, subjects in the overweight group reported an increase in their depression.

The rating for anxiety showed no main effects or any interactions.

ii) Self-esteem

Visual analogue scales: The results from the visual analogue items of self esteem showed no significant main effects of either time or condition, but showed a significant condition by time interaction (F[2,75]=3.37, p<0.05). The means suggest that subjects in the average weight group reported improved self esteem over time whereas both the subjects in the underweight and the
overweight conditions showed a deterioration in their reported self esteem.

Rosenberg self esteem scale: The results from the Rosenberg self esteem scale showed no main effects of either time or condition, but showed a significant condition by time interaction \((F[2, 75]=4.64, p<0.01)\). The means indicate that whereas subjects in the underweight group reported no change in the rating of self esteem, subjects in the average weight group showed a moderate improvement and subjects in the overweight group showed decreased self esteem.

iii) Body dissatisfaction

Visual Analogue Scales: The ratings from of body satisfaction showed no main effects and no interactions.

Silhouettes - The silhouettes were analysed in terms of perceived body size, discrepancy between perceived and ideal and discrepancy between perceived and norm. The results for these ratings showed no main effect of time or any condition by time interactions. However all three measures showed a significant main effects of condition \((F[2,75]=6.33, p<0.005)\), \((F[2,75]=5.7, p<0.005)\), and \((F[2,75]=6.59, p<0.01)\) respectively) indicating that regardless of the manipulation subjects in the three conditions differed in their body dissatisfaction. The means indicated that subjects allocated to the overweight group reported a larger perceived body size and greater discrepancies between their perceived body size and body their ratings of ideal and social norms.

Role of gender in the effect of the experimental manipulation
The results were then analysed to assess the role of gender on the subjects’ ratings of mood, self-esteem and body-esteem, using repeated measures ANCOVA (SPSSPC). The results for these measures showed no significant gender by condition interactions.

**Role of dieting in the effect of the experimental manipulation**

Subjects were divided into unrestrained (n=36) and restrained eaters (n=38) using a median split on their restraint scores. The unrestrained eaters were distributed between the three conditions as follows: overweight (n=8, mean restraint score, 1.50 ± 0.41), average weight (n=15, mean restraint score, 1.46 ± 0.35), underweight (n=13, mean restraint score, 1.44 ± 0.33). The restrained eaters were distributed between the three conditions as follows: overweight (n=18, mean restraint score, 2.79 ± 0.6), average weight (n=13, mean restraint score, 2.9 ± 0.6), underweight (n=7, mean restraint score, 2.4 ± 0.3). The results were then analysed to assess the role of dieting on the subjects’ ratings of mood, self-esteem and body-esteem, with BMI as a covariate using repeated measures ANCOVA (SPSSPC). The results for these measures showed no significant diet by condition by time interactions.

**Discussion**

The aims of the present study were to examine the effect of weighing and manipulation of social norms on mood, self-esteem and body dissatisfaction. The results suggest that the experimental manipulation influenced mood with subjects in the overweight condition reporting an increase in their depression and subjects in the underweight and average weight conditions reporting an improvement. This suggests that a discrepancy between social norms of weight and own weight
may produce a change in mood and that, furthermore, the direction of this mood change relates to
direction of the discrepancy. Perhaps, a label of average weight, reinforces a feeling of
conforming to social norms thus producing a lift in mood. However, being labelled overweight
creates a position of non-conformity and therefore produces a lowering of mood. This supports
research by Kaplan et al (8) which indicates that subjects who perceive themselves to be of normal
weight report lower levels of depression than those who perceive themselves to be overweight.
However, Kaplan et al (8) found that subjects who perceived themselves to be underweight also
reported higher levels of depression, whereas in the present study subjects allocated to the
underweight group reported levels of depression comparable to the average group. Perhaps,
mood is not only related to conforming to statistical social norms in terms of being average, but
also social norms of aesthetics. Subjects who were allocated to the underweight group may have
shown an improvement in mood, because according to social norms of attractiveness, to be
underweight is considered desirable.

The results of present study also indicate that the manipulation influenced self esteem, with both
sets of self esteem measures illustrating a decrease in self esteem in those subjects allocated to the
overweight condition. This again indicates that an unfavourable comparison with social norms
can have a detrimental effect on the individual resulting in a worsening of the individual's self
concept. In addition, subjects who were allocated to the average weight condition reported an
improved self esteem suggesting that a comparison with social norms illustrating conformity may
reinforce a positive self concept. These results are consistent with the pattern of results shown for
mood changes. The mood results were also paralleled for changes in self esteem for those
subjects told they were underweight for the visual analogue scale measure, with subjects reporting a decrease in self esteem. This again suggests that conformity to both statistical and aesthetic norms may result in changes. However, the results from the Rosenberg scale showed no change in this subject group. Perhaps this measure, which is mainly used to measure trait self esteem, is less sensitive to acute changes than the other measures.

It could be assumed that being told that one is either under, average or overweight would have the above effects on mood and self esteem via an impact on body dissatisfaction; for example, a decrease in mood and self esteem following an allocation to the overweight group would be a consequence of an increase in body dissatisfaction. However, the results from the present study showed no differential changes in body dissatisfaction to the manipulation. Perhaps, body dissatisfaction is a more stable construct than both mood and self esteem and remains constant after such acute exposure to a comparison with social norms. This would suggest that the resultant changes in mood and self esteem found in the present study were a direct consequence of the manipulation and not mediated by changes in body dissatisfaction. However, it is also possible that the measures used to detect changes in body dissatisfaction were not appropriately sensitive to change.

The results from the present study therefore suggest that weighing an individual and comparing their weight to social norms results in changes in self esteem and mood. This has implications for the use of weighing and normative height / weight charts both for opportunistic health checks and for the treatment of both overweight and obesity. Weighing individuals is regarded as a central
and neutral means of determining a need for weight related advice and for promoting weight loss as part of a behavioural intervention. Target weights are set as a mode of motivation and repeated feedback on weight change is viewed as means to deter overeating and encourage dietary compliance. However, the results from the present study indicate that perhaps weighing individuals and relating their weight to social norms may not be such a neutral activity. Weight loss is regarded as an important method to improve both the psychological and physical health of the individual. However, it is possible that weighing may be detrimental to these aims. Emphasising discrepancies between an individual's weight and that regarded as normal may create and / or exacerbate lowered mood and poor self esteem. These changes in turn may potentially contribute to overeating which has been shown to result from such negative psychological states (23-25). Lowered self esteem, depression and overeating are in obvious conflict with the goals of weight related interventions. Further research is needed to provide additional support for the potential negative effects of weighing. In particular, a longitudinal design would enable an examination of the longer term effects of weighing and weight monitoring. However, if weighing is detrimental to both the psychological and physical health of the individual, perhaps, additional measures of the success of obesity treatment should be considered.
References


Table 1: Subjects’ profile characteristics.

<table>
<thead>
<tr>
<th></th>
<th>Underweight (n=20)</th>
<th>Average weight (n=28)</th>
<th>Overweight (n=26)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years) Range</strong></td>
<td>24.60 ± 6.37</td>
<td>24.50 ± 7.39</td>
<td>23.96 ± 5.82</td>
</tr>
<tr>
<td></td>
<td>18-49</td>
<td>17-46</td>
<td>16-43</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td>M (9) F (11)</td>
<td>M (14) F (14)</td>
<td>M (12) F (14)</td>
</tr>
<tr>
<td><strong>Height (m)</strong></td>
<td>1.70 ± 0.09</td>
<td>1.71 ± 0.09</td>
<td>1.69 ± 0.07</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>64.45 ± 10.53</td>
<td>69.61 ± 11.71</td>
<td>76.69 ± 11.66</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>22.12 ± 2.12</td>
<td>23.55 ± 2.70</td>
<td>26.81 ± 3.8</td>
</tr>
<tr>
<td><strong>Restrained eating</strong></td>
<td>1.78 ± 0.57</td>
<td>2.13 ± 0.8</td>
<td>2.4 ± 0.8</td>
</tr>
</tbody>
</table>

* Significant main effect of condition (p<0.01).
Table 2. Means for mood, self esteem and body dissatisfaction

<table>
<thead>
<tr>
<th></th>
<th>Underweight (n=20)</th>
<th>Average weight (n=28)</th>
<th>Overweight (n=26)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>time 1</td>
<td>time 2</td>
<td>time 1</td>
</tr>
<tr>
<td>Mood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>21.95 ± 20.4</td>
<td>20.4 ± 29.28</td>
<td>29.28 ± 25.96</td>
</tr>
<tr>
<td>*</td>
<td>26.37</td>
<td>23.74</td>
<td>27.02</td>
</tr>
<tr>
<td>Anxiety</td>
<td>24.65 ± 27.1</td>
<td>27.1 ± 31.71</td>
<td>29.8 ± 29.8</td>
</tr>
<tr>
<td></td>
<td>25.83</td>
<td>28.08</td>
<td>27.34</td>
</tr>
<tr>
<td>Self esteem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rosenberg SES*</td>
<td>32.1 ± 30.75</td>
<td>32.55 ± 30.83</td>
<td>30.78 ± 30.96</td>
</tr>
<tr>
<td>VAS*</td>
<td>551.9 ± 535.46</td>
<td>535.45 ± 548.75</td>
<td>575.5 ± 575.4</td>
</tr>
<tr>
<td></td>
<td>93.74</td>
<td>104.29</td>
<td>106.47</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAS</td>
<td>320.4 ± 300.32</td>
<td>308.4 ± 300.32</td>
<td>303.04 ± 303.04</td>
</tr>
<tr>
<td>Perceived body size</td>
<td>5.85 ± 5.95</td>
<td>5.95 ± 6.5</td>
<td>6.82 ± 6.82</td>
</tr>
<tr>
<td>vs ideal</td>
<td>-0.10 ± -0.05</td>
<td>-0.05 ± 0.43</td>
<td>0.464 ± 1.38</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>0.76</td>
<td>1.53</td>
</tr>
<tr>
<td>Perceived vs norm</td>
<td>-1.25 ± 1.33</td>
<td>-0.5 ± 1.82</td>
<td>-0.26 ± 1.77</td>
</tr>
</tbody>
</table>

* Significant condition by time interaction (p<0.05).